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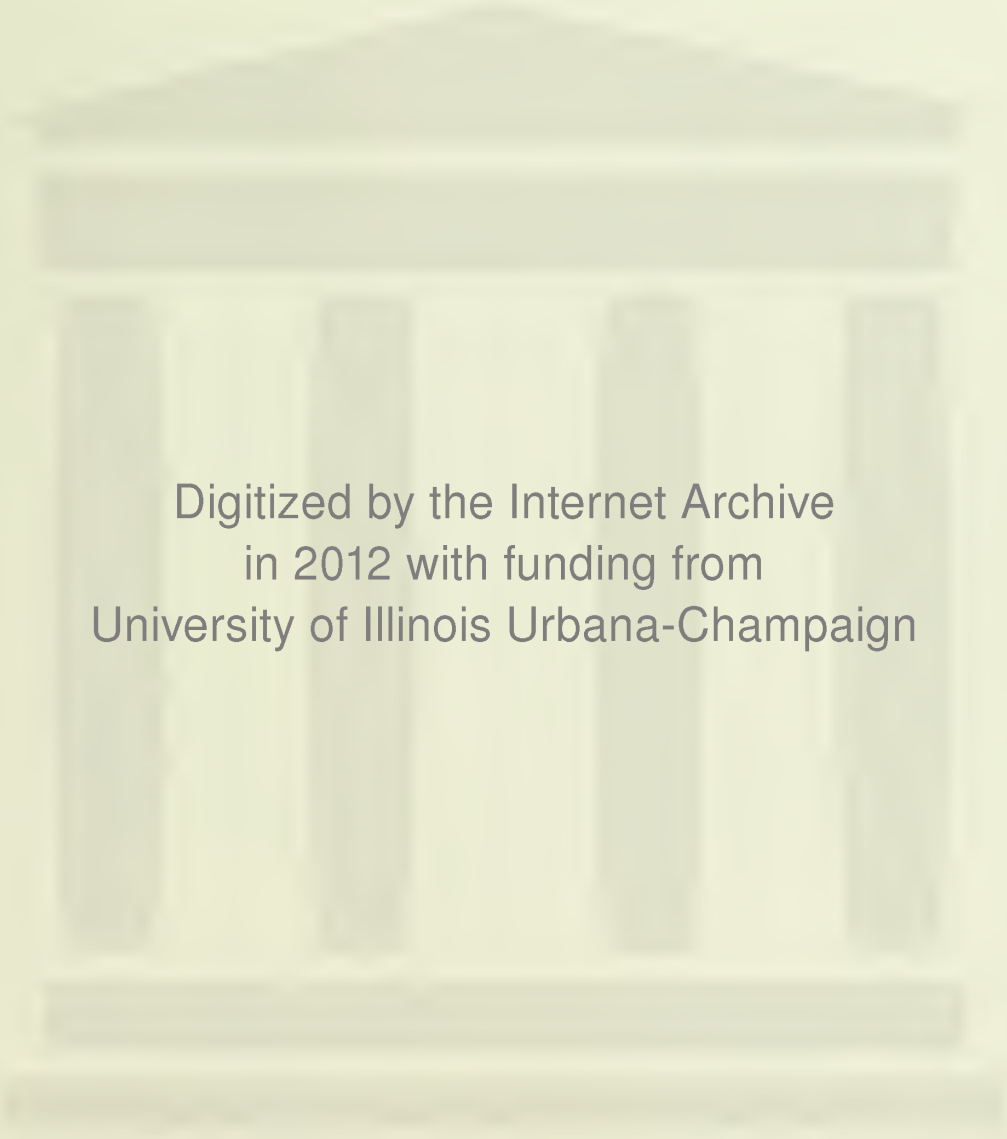

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INTRODUCTION

Vertical coordination -- where the payment of the market price for a good or service is replaced by (1) internal development within the firm, (2) acquisition, (3) merger, or (4) some type of formal (or informal) contract -- has been an economic concern dating back at least to Adam Smith's (1776) The Wealth of Nations. The conversation on vertical coordination (or the more prosaic "make or buy" decision) by (agricultural) economists, accountants, procurement specialists and marketing and management strategists has been extensive since the turn of the 20th century[1]. Surely there must be some pearls of insight contained in this massive literature that can be of use to practitioners in the field of agriculture (and elsewhere). Indeed, important ideas on vertical coordination have been expressed by a diversity of individuals ranging from Nobel prize winners in economics (e.g., Kenneth Arrow, Ronald Coase, Douglass North and George Stigler) to the multitude of practitioners where "make or buy" decisions are their livelihood.

Oscar Wilde once noted that: "Truth is rarely pure and never simple." In truth, vertical coordination problems are rarely pure and never simple. This paper attempts to present vertical coordination problems in a comprehensible and efficient manner while remaining faithful to the complexities involved.

General theme. Before providing details on the vertical coordination problem we consider the general outline for vertical coordination in the following proposition:

> **Proposition 1: In order to avoid endless confusion on the vertical coordination problem it is essential that the manager separate two distinct issues:**
>
> > **Issue #1: What is the objective for vertical coordination? Or put differently, what efficiencies, risk-sharing, or market power advantages are being sought?**

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[1] There have been well over 600 published works on vertical coordination in economics, marketing, and management journals. A complete list of these works is available from the authors upon request.

Issue #2: Given a compelling objective for vertical coordination in issue #1 above, the critical question concerns what organizational form (e.g., vertical contracts or vertical mergers & acquisitions) best achieves the desired objective.

Section 1 considers the various **objectives** for vertical coordination that may provide efficiency, risk-sharing, or market power advantages. Section 2 discusses the various types of vertical contracts to achieve vertical coordination objectives. Section 3 considers the advantages and disadvantages of vertical financial ownership. Section 4 discusses the critical dimensions of vertical coordination that managers should consider **in the choice of organizational form** (e.g., vertical contracts versus vertical financial ownership). Section 5 provides conclusions.

Section 1: Vertical Coordination Objectives

The traditional vertical market channel in the agricultural and food marketing system starts with the farm and goes to the manufacturer (first handler), who may be a processor, packing house/elevator, broker, or manufacturer, and then goes to the wholesaler or retailer (Kilmer, 1986). Recent changes in demand and supply conditions have triggered changes in vertical coordination. This section restricts discussion to motives for why we observe (and have observed) vertical coordination both in agriculture and in other sectors in the United States economy[2].

A careful study of history and theoretical contributions reveal an embarrassment of riches of possible objectives for vertical coordination. Twenty-six objectives are discussed in this section.

1. A fundamental objective for vertical merger has been the managers' "**search for synergy**". That is, on the demand side it makes sense to sell certain items together (e.g., hammers and nails at a hardware store). On the supply side there are often technological complementarities or what economists call "economies of scope" (Baumol, Panzar and Willig, 1982). For example, in bringing together processes in the manufacture of iron and steel, thermal economies from the shareable input of the blast furnace are achieved. Thus, the cost of producing iron and steel together is less than the sum of producing iron and steel in separate blast furnaces. Similarly, the cost of producing wool and mutton together is less than the cost of producing wool and mutton separately.

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[2] Alfred D. Chandler (1977) provides the most comprehensive overview of the history of vertical integration in the United States.

2. Relatedly, vertical coordination of an input with multiple end products may be motivated by the desire to achieve **economies of scale** in the production of the input. For example, economies in corn wet milling processing can be achieved by making high fructose corn syrup and ethanol from the yielded corn sugars.

3. A third objective that surely most managers (and academics) can relate to is Plato's observation that "knowledge is power". If a manager can gain more accurate information than the competitor such information can provide distinct advantages. For example, if an "upstream" firm (e.g., a firm producing a raw material) has more information about supply conditions than any of the "downstream" manufacturers that use these raw materials then it is possible that a manufacturer may want to improve its information by vertically merging with the upstream raw material firm. This improved information may allow the manufacturer to make improved production run decisions relative to its competitors. The label that economists give to this (and a host of other scenarios) is to "**reduce asymmetric information**". Here, the asymmetric information is that the upstream firm knows more about their supply conditions and customer needs than downstream firms (Arrow, 1975). Conversely, the upstream firm may want to gain information from the downstream firm in order to accelerate innovation and improve quality. For example, a genetics firm may want to learn about the carcass performance of their product.

4. A related "asymmetric information" problem is that the manufacturer buying a raw material may not know the cost of production. Clearly, this puts the buyer in a poor bargaining position. Thus, internal production of some of the raw material ("tapered integration") can reduce the information disadvantage of the manufacturer and **improve their bargaining power** with the raw materials supplier (Porter, 1980). Of course, if it is revealed that the firm can produce the input at lower production costs than can any input supplier they should shift to in-house production.

5. Vertical integration may be motivated by the desire to **promote the use of a firm's primary product**. For example, Alcoa's forward integration into cookware promoted the use of its aluminum.

6. In cases where knowledge is not easily patentable, product development by end users may be more readily transferred to different departments (subsidiaries) of a single firm than when the user and the producer are linked by the market. Here the objective is not to eliminate asymmetric information but rather to **maintain asymmetric information.** Also, if the knowledge generated internally may be applicable to a wide range of products, there may be an ability to appropriate the information internally. For example, if Westinghouse invents a more efficient small motor it may be able to leverage this distinctive competence across a broad range of appliances. The firm may "internalize externalities" (i.e., retain the gains of technological spillover across products and/or divisions). Keeping innovations proprietary may be a major reason why drug companies, such as Pfizer, are vertically integrated into research and development. Honda's core products are internal combustion engines and power trains and they do not outsource these critical items. Armour and Teece (1980) argue that vertical financial ownership can: "enhance innovation through the sharing of technological information common to separate stages of an industry, through facilitating the implementation of new technology when complex interdependencies are involved, and through the formulation of more astute research objectives" (1980: 470). Armour and Teece (1980) demonstrate a strong and statistically significant relationship between vertical financial ownership (measured by the number of stages among crude production, refining, transportation, and marketing) and technological innovation in the U.S. petroleum industry.

7. Historically speaking, there may be a **life-cycle effect** to vertical integration. Adam Smith (1776) noted that "the division of labor is limited by the extent of the market [i.e., demand]" and George Stigler (1968: pp. 135-136) provides an elaboration:

> Young industries are often strangers to the established economic system. They require new kinds or qualities of materials and hence make their own; they must overcome technical problems in the use of their products and cannot wait for potential users to overcome them; they must persuade customers to abandon other commodities and find no specialized merchants to undertake this task. These young industries must design their specialized equipment and often manufacture it, and they must undertake to recruit (historically, often to import) skilled labor. When the industry has attained a certain size and prospects, many of these tasks are sufficiently important to be turned over to specialists. It becomes profitable for other firms to supply equipment and raw materials, to undertake the marketing of the product and the utilization of by-products, and even to train skilled labor. And, finally, when the industry begins to decline these subsidiary, auxiliary, and complementary industries begin also to decline, and eventually the surviving firms must begin to reappropriate functions which are no longer carried on at a sufficient rate to support independent firms.

Thus, vertical de-integration is the predicted development in growing industries and internalization of activities is predicted in embryonic and declining industries. Integration in the textile industry is held to be consistent with the hypothesis. In general, however, the actual evidence of Adam Smith's "theorem" is mixed for reasons that we will discuss in Section 4 below.

The slowness of open market mechanisms in responding to changes in consumers' food quality demands for leanness, consistency in taste, etc., and the lack of producer responses have, in part, lead to increased vertical coordination in broilers, eggs, turkeys and vegetables.

8. While the idea that vertical mergers are motivated by the **assurance of supply** in the case of backward integration of the upstream firm is not new (Willoughby, 1901) its importance is almost surely high. In fact, the manufacturer may decide to produce the input even when it experiences higher production costs. The higher production costs may be an insurance payment in "thin markets' (i.e., when there are few suppliers). Furthermore, in time, greater experience may bring down the production costs, and the integration may lead to higher profitability.

9. Similar to the assurance of supply for backward integration, the supplier may forward integrate into retail outlets to **assure access to the market**. Vertical contracts such as exclusive dealing contracts may also be used.

10. The manufacturer may choose forward or backward integration to **control the quality** of services to the customer or quality of critical inputs. For example, a grain processor may want some vertical coordination with the farmer relating to their harvesting equipment. Similarly, Motorola involves their suppliers in the review of specifications.

11. Relatedly, vertical integration may be an adaptive response to a **product differentiation** strategy that is driven by changing customer demand and/or technology supply conditions. For example, product differentiation at the farm level (e.g., corn with high oil content, soybeans designed for specific international markets) may lead to different quality control and monitoring costs for which new vertical coordination organizational forms may evolve (Barry, Sonka and Lajili, 1992). Attempts to promote new products may also require greater vertical coordination.

12. The **coordination of more complex (interdependent) products** may necessitate vertical coordination. In the automobile industry, Monteverde and Teece (1982) found that the complex electrical system of both Ford's cars and General Motor's cars were produced in-house. It may be highly desirable to coordinate decision-making through internal, adaptive, and sequential processes. Schrader (1986) argues that with advances in biotechnology, agricultural products may become more complex and require greater vertical coordination.

13. Occasionally, such forward and backward integration might be motivated by the motive of **foreclosure of inputs**. Famous cases of alleged foreclosure include Brown Shoe and Standard Oil. In the Brown Shoe case the shoemaker's purchase of a chain of retail stores was held unlawful (Brown Shoe Co. v. United States, 370 U.S. 294, 324 (1962)). Standard Oil Company (New Jersey) was alleged to have attempted backward integration to acquire a producer of potash. This backward integration was held unlawful because it resulted in "foreclosure" of from 1 per cent to 2 per cent of the domestic production of potash (United States v. Standard Oil Company (New Jersey), 253 F. Supp. 196 (1966))[3]. It is doubtful that foreclosure of inputs was the primary motive of either company in these cases, however. The case of U.S. cement manufacturers' acquisition of numerous ready-mix concrete companies also raised fears of foreclosure which may have lead to a cycle of further vertical mergers. In other circumstances, an increase in horizontal concentration at one stage of the value chain may induce vertical mergers due to concerns of market foreclosure in thin markets.

14. Related to foreclosure, vertical mergers may on occasion be used by larger firms as a **barrier to entry** to smaller firms. When entry into either of two separate stages of the value-added chain is already difficult because of large capital requirements, combining successive stages will further raise entry barriers because new entrants must enter two stages rather than one. This motive is most likely in concentrated industries (Williamson, 1975).

15. Vertical merger may also help **facilitate oligopolistic coordination**. Adelman (1972) suggested that where control of crude oil supplies remained highly concentrated, vertical mergers into refining enhanced stability by making it more difficult for an oligopolist to plan secretly to increase market share. Since there were few significant independent refiners, no company could increase its output of crude oil without first building refineries and distribution systems which signaled their plans to competitors.

16. Vertical mergers may also be used as a **vertical price squeeze**. For example, the price of crude oil may be raised and the price of gasoline lowered to such an extent that an independent refiner could not operate. Often, however, these price squeezes are an outcome of price discrimination.

17. The **price discrimination** objective for vertical merger can be illustrated by the example of Alcoa which faced both highly price-sensitive markets (such as cookware where several substitutes were available) and price-insensitive markets (such as airplane producers where for a time there were few substitutes) for aluminum sales. Clearly, Alcoa had a profit incentive to charge different prices in the different markets. Besides antitrust issues, a more fundamental economic problem for Alcoa was the arbitrage problem. Alcoa used vertical mergers into cookware to bypass this "reselling (arbitrage) problem" and then charged higher prices in the price-insensitive markets (Perry, 1980).

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[3] We regard managers' pursuit of (monopoly) profits as legitimate if their actions are within the "rules of the game" to use John Maynard Keynes' phrase. Nevertheless, within the realm of public policy and the concern for consumer welfare we also think that there is a place for antitrust law.

18. Vertical integration may also be used by a firm to **reduce uncertainty**. For example, if firms must make decisions concerning price and production before actual demand is realized then vertical integration can be a way to **transfer risk**. Firms vertically merge to ensure a supply of inputs for their "high probability" demand and purchase from upstream firms their "low probability" demand. Upstream firms fulfill an insurance role for the downstream firms (Carlton, 1979). [Note that vertical integration does not, of course, reduce fluctuations due to aggregate market demand]. Sexton (1986) argues that a restricted membership co-op can satisfy its high probability raw product demand from members and attempt to procure low probability demand from non-members thereby shifting risk. Also, farm debt in the 1980s may have made the sharing of capital expenditures more imperative, and may have caused more independent farmers to become involved in vertical coordination arrangements. For example, under contract hog production, a producer usually owns the buildings and equipment whereas the contractor owns the feed and livestock. Vertical coordination in the hog sector could release between 20% and 40% of assets from a farmer's balance sheet. This release may provide profitable alternatives for reinvestment of capital to higher yield uses (Featherstone and Sherrick, 1992).

19. A special type of uncertainty may be due to **perishability** of the product. For example, perishability is a significant factor for commodities such as milk, fruits and vegetables and to a lesser extent meat animals. Producer-"first-handler" integrated exchange arrangements are more common in perishable commodities than storable commodities (Chandler, 1977; Sporleder, 1992). We suggest that the key concept is the time factor in distribution. Analogously, while newspaper publishers generally own their own presses (since the value of their information is rapidly perishable), book publishers are less vertically integrated and do not own their own presses (Klein, Crawford and Alchian, 1978).

20. If there is significant market power in several stages of the "value-added chain" from raw materials to finished product then the cumulative effect of above-competitive pricing leads to an undesirably high price for the consumer and a profit loss from the perspective of the vertical system. Here, a vertically integrated firm can **avoid the myopic chain of successive above-competitive pricing** (Blair and Kaserman, 1983).

21. Suppose a car manufacturer can use a mix of plastics which are competitively priced and a specialized steel which is non-competitively priced. Clearly the manufacturer can choose to minimize the use of the highly priced steel and substitute more plastics. Economists refer to this flexibility of input mix as "variable-proportions technology" (Blair and Kaserman, 1983). That is, the manufacturer can vary the proportion of inputs (in this case, plastics and steel). Given the "true" cost of plastics and steel there may be a unique optimal steel-plastics combination that is not being realized due to the upstream monopoly pricing by the steel producer. A vertical merger permits the integrated firm to **achieve efficiency without scale or input utilization distortion** and as a first approximation these cost savings accrue as additional profits to the integrated firm. In fact, if the profit-maximizing post-merger output differs, the incremental gains to profit may be still larger.

22. An obvious motive for some vertical mergers has been **tax considerations**. For example, in the early 1970s vertically integrated petroleum firms found it profitable to increase the price of crude relative to the price of final products in order to shift as much of their reported earnings as possible to the raw materials extraction stage, which enjoyed tax preferences associated with resource depletion (Bolch and Damon, 1978). In both the United States and Europe, the integrated petroleum companies have tended to show very low accounting profits in their refining and marketing operations, compensating with high returns at the less heavily taxed crude oil stage. Moreover, the widespread adoption of franchises by oil companies in the 1930s was strongly motivated by the desire to avoid chain store taxation, Social Security

obligations, and labor legislation. Multinational corporations may be organized, in part, to exploit differential taxation. If tax rates are lower in a country where one stage of production takes place (e.g., raw material extraction) than in another country where some other stage of production is performed (e.g., fabrication), then the vertically integrated multinational firm may be able to reduce its overall tax burden through the choice of an appropriate transfer price. Tax considerations can also push in the opposite direction. In agriculture, Schrader (1986) notes that in the past, Production Credit Association and Farmers Home Administration loans to farmers may have been on more favorable terms than were available to a contracting firm.

23. **Regulatory change** may also stimulate change in vertical coordination structure. For example, changes in food safety laws may significantly increase the monitoring costs facing food companies. As a result, alternative forms of vertical coordination that minimize the costs of compliance with the new laws may become necessary (Hobbs and Kerr, 1992).

24. **Changes in information technology** have changed the viability of vertical coordination strategies. For example, Frito-Lay has contractual arrangements with producers for specific types of corn. The processed commodity is tracked all the way through the market channel on a bag-by-bag basis (Streeter, Sonka and Hudson, 1991).

25. While this paper focuses on efficiency, risk-sharing and market power motives to explain organization form, it is undeniable that **antitrust laws and the political arena, in general**, can have a major impact on the choice of organizational form. For example some forms of vertical contracts (e.g., resale price maintenance) may be the most efficient (cost minimizing) way to achieve a given objective but the organizational form is per se illegal. Thus, a vertical merger may obtain. Babb (1992) notes that a coalition of animal rights, family farm and environmental groups could be a powerful voice in the selection of production-marketing systems. In this paper, antitrust laws, politics, and regulatory rules will be considered outside the managers' area of control. Clearly, in practice the amount of resources that firms and industry groups deploy to influence rules can be considerable. Or put differently, the choice of organizational form may depend crucially on the social-legal environment.

26. A major objective for vertical coordination is the **minimization of transaction costs** (Williamson, 1975). These costs include drafting, negotiating, and safeguarding agreements. Further transaction costs may occur after a deal is made. There may be haggling costs, arbitration and mediation costs, and bonding costs of determining collateral and liquidated damages. Property right laws can clearly influence transaction costs (Coase, 1988).

The cost minimization motive relates directly to the choice of organizational form which we consider in section 4 after discussions of vertical contracting (section 2) and vertical financial ownership (section 3) have been formally presented.

Section 2: **Vertical Contracting**

While the section above should convince a manager that there are many possible reasons for vertical coordination that might be considered, a second pressing question is: what organizational form

should be used? Section 2 provides a detailed discussion of vertical contracts. Section 3 then considers the advantages and disadvantages of vertical financial ownership. Section 4 suggests criteria for determining the choice of organizational form (e.g., vertical contracting or vertical financial ownership).

The analysis of vertical contracts may be described in principal-agent terms (Katz, 1989) where vertical contracts are responses to goal incongruence, uncertainty, asymmetric information, opportunism (ex ante adverse-selection, ex post moral hazard and hold-up problems),[4] and the need to share risk. Although vertical contract mechanisms will, for the most part, be discussed individually, we hasten to add that in any particular case it is likely to be the **bundle** of vertical contractual mechanisms which represents the solution to a vertical coordination problem. Or put differently, in various circumstances there may be a package of vertical mechanisms that are sufficient to achieve joint-profit maximization. For example, a bundle of vertical contractual mechanisms may be found in the provisions stipulated by Purina Mills, Wayne Feeds, and other feed manufacturing franchises.

The following proposition captures the essential ideas of this section:

Proposition #2:

(a) A particular vertical contract mechanism can be used for different objectives.

(b) A large number of dissimilar vertical contract mechanisms can be used to achieve the same objective.

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[4] **Ex ante adverse selection** (hidden information) can be seen in the used car market (sometimes called the "market for lemons"; Akerlof, 1970). Over time the low quality autos (the lemons) will more likely be brought to market than the high quality autos because the owners of the high quality autos will not be able to receive the true value of the auto. **Ex post moral hazard** (hidden action) refers to cheating on a contract or shirking in an employment relationship. **Ex post hold-up problems** are attempts by contracting parties to renegotiate to achieve a greater share of the gains once commitments are already made. As one might imagine the threat of hold-up may be quite severe in the case of perishable products. All three problems suggest that vertical contracts must be sophisticated in order to align the incentives of the principal (the payer) and the agent (the doer).

Besides direct sales and the use of market price, there are a host of vertical contract mechanisms that may be used to achieve coordination:

Direct Sales and Market Price. Clearly in a capitalist society we rely on the price system to coordinate a tremendous number of transactions. That the price system coordinates economic activity as if we were led by an "invisible hand" (Smith 1776) is truly a marvel. We will reserve the term "price coordination" for this option. When we go beyond the price system itself to coordinate activity we are in the range of vertical coordination.

1. **Simple, short-term contracts.** Concern for maintaining reputation, few transaction-specific assets, and a well-developed body of common law allow farmland leases in the American Midwest to contract based on a high degree of trust where only rudimentary details are spelled out (Allen and Lueck, 1992).

2. **Lump-sum entry fees.** For example, in franchising vertical coordination, the franchisee may pay the franchisor a lump-sum franchise fee. This fee can serve two purposes for the franchisor: (1) "ex ante screening", that is, only the more qualified entrepreneurs will be willing to pay a high entry fee; and (2) ex-post cooperation (a reduction in moral hazard), that is, the franchisee having invested a lump-sum has a greater incentive to execute the details required by the franchisor. For this fee, the franchisee typically receives training and other initial services, and perhaps most importantly, use of the franchisor's trademark.

3. **Royalties.** For example, the manufacturer can impose a payment proportional to the number of units sold downstream. Alternatively, the royalty fee might be 5% of gross sales, for example. In certain cases, the royalty rate decreases as sales volume increases. In a franchise system, royalties may be desired by the franchisee as well as the franchisor. If the franchisor obtained no royalty from current sales then there would be no incentive for the franchisor to enforce quality standards for the entire franchise system.

4. **Profit-sharing arrangements.** For example, sharecropping arrangements (share tenancy) may be used in commodity production in order to achieve risk sharing and reduced transaction costs. The similarity between sharecropping and franchising in terms of risk sharing and reduced transaction cost objectives should be noted.

5. **Resale price maintenance.** Manufacturers sometimes set not only their own wholesale prices but also the prices at which their products are offered for sale by dealers and distributors. Minimum resale price maintenance occurs if, for example, Nintendo required its retailers to sell its video game for $40. Maximum resale price maintenance occurs if, for example, the New York Times required its home delivery distributors to sell the newspaper for no more than $4 per week. {note: a vertically integrated firm could set its own price}. Minimum resale price maintenance (RPM) can be used to illustrate our **proposition 2(a)** above:

> (i) RPM may be used by a manufacturer to suppress retailer price competition (by a retailer who might free-ride and not provide service) in order to induce retailers to compete on non-price pre-sale service that the manufacturer desires (Telser, 1960).

(ii) RPM may be a way to eliminate "loss leaders" and achieve a quality signal by dealer certification of product quality (Marvel and McCafferty, 1984). In some sense RPM is a way for manufacturers to purchase quality or style certification from reputable dealers. A quality signaling motive to achieve high quality image may help explain RPM for such products as Levi-Strauss jeans, Florsheim shoes and London Fog raincoats.

(iii) Eliminating discounters may result in a relatively larger number of smaller outlets. RPM may be a way to prevent price cutting that could undermine the manufacturer's desired number and location of smaller retail outlets.

(iv) RPM may solve the myopic chain monopoly problem, discussed in point #20 in the previous section. Maximum RPM can help achieve the profit maximizing price, rather than the higher price that would result from above-competitive pricing at successive stages in the vertical chain.

(v) RPM may be a mechanism for a manufacturers' cartel. With RPM, if a manufacturer cheats by lowering the wholesale price, resellers will be unable to pass the discounts through to their customers without deviating from the maintained prices. Collusive manufacturers can boycott resellers who will not maintain prices. Moreover, RPM may be used to prevent countervailing buyer power from exerting a constraining influence on monopoly pricing by the manufacturer.

(vii) RPM could also be a mechanism for a dealer cartel. The manufacturer is used (vertically) to police the RPM and stabilize the retailers' horizontal collusion as in the case of distilled spirits in the United States (Ornstein and Hanssens, 1987). Clearly, the supplier must lack superior alternatives for distribution.

(viii) The use of resale price maintenance may also be used by manufacturers to obtain shelf space as an alternative to slotting allowances (shelf space rental fees) (Shaffer, 1991). A full analysis should also address the question of why the dealers use their collusive monopsony power to obtain a protected margin instead of lower prices from the supplier(s).

6. **Exclusive territories**. A manufacturer may provide the dealer with a certain territory for the dealer to control. For example, a local electronics store that sells a particular brand of television is granted a guarantee that no other store within a two-mile radius will be allowed to sell that brand of television. Other examples include: if General Motors agreed to allow only one GM dealership in a city; a beer distributor limits sales to a specified geographic area; and local bottlers are granted exclusive geographic territories in which to distribute products trademarked by a small oligopoly of nationwide syrup producers. A second type of restraint is a customer restriction. Under customer restrictions, certain classes of consumers are reserved for the manufacturer's own sales force. A personal computer manufacturer, for example, might reserve sales to Fortune 200 companies for the manufacturer's national sales force. Once again, a number of objectives may induce the manufacturer to provide the retailer with an exclusive territory: (i) The wider margin encourages the dealers to carry larger inventories and spend more money on advertising and other promotional activities; (ii) Wider margins increases the dealers cooperation with the manufacturer since the dealer wants to maintain its valued (discounted) future

margins. This price premium of increasing the dealers' rents can then lower the monitoring costs for the manufacturer; and (iii) The franchisor must be able to convince the franchisee that no competing franchises will be established once the original franchisee has sunk nonrecoverable start-up costs. Moreover, a franchisee would not be willing to pay the value of the monopoly rents (via the franchise fee) that could be generated from owning the franchise because once he purchased the franchise, the franchisor could then opportunistically sell another franchise (at a lower price) to a competitor, which would destroy the franchisee's monopoly position.

7. **Tying arrangements.** Tying arrangements involve multi-product bundling. The manufacturer may have an incentive to bundle product and services together to maintain the integrity of the product. For example, tying may be used to control quality of complementary products to protect the good will of the manufacturer-- such as tying installation, equipment and maintenance of an electronics system together. Tying has also been used to evade price controls. During the 1970s when gasoline was under maximum price controls one station was alleged to have offered gasoline at the controlled price to anyone who would purchase a (lucky?) rabbit's foot for $5. Tying arrangements may also be used by manufacturers as a means to price discriminate (often based on the intensity of use). For example, punch cards have been tied to computers, cans to can-closing machinery, repair parts to automobiles, staples to stapling machines, toilet paper to dispensers, mimeograph supplies to mimeograph machines, rivets to riveting machines, etc. In agribusiness, the farm equipment manufacturers meter the use of tractors and other implements by their sales of replacement parts. The tied good serves as a counting or metering device, the tying arrangement results in streams of payments flowing from the users of the machine to its seller. Those using the machine more intensively pay more; price discrimination is achieved. For example, copying machine makers often refer to their toner as "black gold." Consider the following tying arrangement in the motion picture industry (where such arrangements are often referred to as "block booking"):

Movie:	E.T.	Plan 9 from outer space
Theater:		
Family theater	$1000	$700
Cult theater	$600	$800

In this case, the cult theater values the movie "plan 9 from outer space" more than the movie "E.T." ($800 > $600) while the family theater values "E.T." more ($1000 > $700). Here, a single price of $600 for "E.T." and $700 for "Plan 9 from outer space" would yield a total of $2600 for the seller. If the seller has a tying arrangement where each theater must pay $1400 for the two films together, then the seller can receive $2800. Economists refer to this as "getting more of the consumer surplus." Associated Artists Productions negotiated a contract with one television station for $118,800 in which the station had to take a bundle of 99 films. To get Casablanca for example, the station had to take Tugboat Annie Sails Again.

8. **Exclusive dealing**. Exclusive dealing is a contractual requirement by which retailers or distributors promise a supplier that they will not handle the goods of competing producers[5]. For example, an independent gasoline service station would buy all of its gasoline and motor oil supplies from Mobil Company or a tire dealer sells only one manufacturer's brand. Exclusive dealing arrangements may be motivated by: (i) the need to facilitate long-term planning; (ii) the motive of foreclosure or raising rivals' costs; (iii) to elicit dealer services and energy for their product; (iv) to provide the manufacturer with a property right to his promotional (e.g., advertising) investment (Marvel, 1982); and (v) to economize on marketing, inspection and sorting costs (Gallick, 1984). For example, the inspection, sorting and grading required for tuna are reduced through exclusive dealing arrangements. Processors simply buy the boatowner's entire unsorted catch at a price reflecting average quality. If the processors tried to do this without restricting the boatowner's ability to sell part of his catch elsewhere, boatowners would have the incentive to sell the higher quality tuna to competing processors (at higher prices) and thus increase the sorting and inspecting costs of marketing tuna. Exclusive dealing contracts between boatowners and processors that require that a boat's entire catch be sold to a particular processor prevent the duplicative inspection and sorting costs that would otherwise prevail. In addition, the processors' equity interests in vessels serve to reduce the hold-up incentive of the processor created by the exclusive dealing contracts. For those who doubt the importance of transaction costs, the transaction costs savings in the tuna industry were roughly estimated in excess of $12 million per year. Relatedly, Sunkist Growers, Inc. sorts fresh grade fruit (such as oranges and lemons) into a limited number of grades, and growers are paid according to the number of units harvested per grade, despite any remaining within-grade quality differences. The packinghouse and its affiliated growers, however, must exclusively contract with Sunkist to market all the fruit of the affiliated growers throughout the contract year. Additional grading, inspection, and negotiation costs are thereby avoided by exclusively dealing on the basis of the average within-grade quality over the contract period.

9. **Requirements contracts.** Under a requirements contract, the buyer agrees to purchase and the seller agrees to supply the buyer's total requirements of particular goods during a specified period of time. In U.S. automobile franchises, requirement contracts together with territorial protection have historically been an integral part of manufacturer-dealer coordination. In agribusiness, farmers in fruits and vegetables may contract with a cooperative to provide their entire crop or crops. Objectives may be for (i) foreclosure; (ii) long-term planning for the buyer; and (iii) to reduce selling expenditures for the seller, among others.

10. **Vertical financial ownership**. The manufacturer usually has the option of vertical acquisition or merger where interfirm contractual relationships are replaced by intrafirm employer-employee transactions. Inherent in the concept of vertical financial ownership is the elimination of contractual or market exchanges and the substitution of internal transfers within the boundaries of the firm via internal development or merger.

The upshot is that vertical contracts attempt to achieve the same goals as the vertically integrated firm to: (1) maintain coordination to achieve economies of scope; (2) establish agreements to periodically

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[5] The well known Japanese "Keiretsu" system is quite similar to exclusive dealing contracts.

revise complex products; (3) allocate risk-bearing; (4) coordinate information gathering to achieve economies without jeopardizing commercial secrecy; (5) avoid substitution away from factors priced above marginal costs; and (6) monitor and enforce contractual arrangements. In economic terms both vertical contracts and the vertically integrated firm face a host of "principal-agent problems". Aligning incentives and monitoring performance are at issue.

Proposition 2a suggests that vertical coordination mechanisms cannot be understood divorced from the context in which they are placed[6]. At this point, **proposition 2b** should also be clear. For example, to achieve the objective of price discrimination a manufacturer could choose (i) a tying arrangement, or (ii) resale price maintenance and exclusive territories, or (iii) vertical financial ownership, or a host of other mechanisms. If the manufacturer's objective is to increase pre-sale service of their product, alternative vertical coordination devices are available (e.g., RPM, or exclusive territories, or vertical financial ownership).

A fundamental idea is that in our economy there is **competition among alternative organizational forms**. Although historical accident and governmental intervention can partially explain the organizational forms we observe in the economy, our main case presumption is that economic actors will choose the organizational form that achieves their desired objective at the lowest cost. Effective product market competition and capital market competition lead to cost minimization.

In this section then we can describe a franchise contract in transaction cost minimization terms. Consider the several standard clauses of the franchise contract of (1) management assistance to the

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[6] Without context it is impossible to know the objective of RPM, for example. Some of the objectives are efficiency enhancing while other objectives are of possible antitrust concern. The only defensible stance is that the legality of all types of vertical contracts (and vertical mergers) should be based on a "rule-of-reason" (Phillips and Mahoney, 1985). Courts currently consider different types of vertical contracts with different legal standards (e.g., RPM is per se illegal; some non-price restrictions follow a rule-of-reason case approach). The courts seem fundamentally muddled in failing to recognize that (efficiency and monopoly) objectives must be determined by looking at vertical contract mechanisms in context. Courts' attempts to infer objectives from the form of vertical contract mechanisms are misplaced.

franchisee; (2) control by franchisors of hours, prices, and conditions of plant; (3) franchisee royalty payments; (4) termination clauses; and (5) investment in "hostages" (e.g., specific capital) to achieve ex ante screening and ex post bonding effects (Williamson, 1985). These clauses may be viewed as a set of **cross-enforcing provisions** that minimize the costs of monitoring and enforcing contracts. The key point is to understand vertical contracting in its entirety. Thus, a franchisee's willingness to invest in specific assets (a hostage), the price premium or rents received by the franchisee, and the monitoring costs incurred by the franchisor are interrelated.

At this point we can see that the list of objectives discussed in the first two sections of this paper suggests **why** vertical coordination is needed but does not provide much guidance on **how** to achieve vertical coordination. That is, when should vertical contracts be chosen and when is vertical financial ownership preferable? Section 3 considers the advantages and disadvantages of vertical financial ownership, while section 4 considers the salient dimensions to consider in the choice of organizational form.

Section 3: **Vertical Financial Ownership: Advantages and Disadvantages.**

The issue of whether to achieve vertical coordination objectives by vertical financial ownership is part of a more general question concerning the "nature of the firm" (Coase, 1937). In the agribusiness context, King (1992) describes the issue as determining the appropriate boundaries of the firm. What are the advantages of the firm over contracting (or put differently, what are the disadvantages of contracting)?

A significant explanation for the existence of the firm (vertical financial ownership) is due to the problem of **bounded (limited) rationality** of the contracting parties in an environment of **uncertainty** that is complicated by the fact that some individuals may behave in an **opportunistic** manner that often is problematic when there are **small-numbers** of bargaining alternatives (Williamson, 1975):

a) Given that contracting parties have bounded rationality and cannot think of all contingencies in advance, contracts are necessarily incomplete. Contracting costs may be high if the parties

incur the upfront cost of considering all the possible bridges they may come to, or alternatively, suffer contractual litigation for a contingency that was not considered. The firm (i.e., vertical financial ownership) may allow for adaptive, sequential decision-making. The firm will cross the bridges (address the contingencies) when they come to them.

b) A complexity of parts in production may require direct supervision. The firm may provide a structured environment for greater efficiency in coordinating the design, production, and marketing of both the end product and its components as a single system. Thus rapid adaptation (as well as secrecy of design) is maintained through vertical financial ownership.

c) The firm can also economize on bounded rationality by the use of common language and the development of an emerging culture that promotes convergent expectations among contracting members. The successful firm may achieve an informational processing advantage that improves plan consistency in corporate, business and functional objectives. Moreover, in such a culture, associational benefits accrue to team members. Quasi-moral concerns develop. The well-being of team members matter. Cooperation is promoted and a sense of fairness obtains. Such "intangibles" may provide the substantive worth of the firm.

d) Over time, the firm may also learn the skills of the workers and allocate labor more efficiently. Also, the firm may appropriate some of the gains of firm-specific capital and "learning-by-doing efficiencies" including tacit knowledge via organizational learning.

(e) The firm may mitigate costly haggling since the preemptive claims that may be achieved by contractual bargaining have been replaced by a joint profit maximizing incentive structure that can be more effectively implemented where the firm has advantages in both monitoring and (internal) auditing respects relative to contracting parties. A firm has a legal right to audit its divisions but no right to audit outside contractors. Asymmetric information is reduced within the firm (relative to contracting) and opportunism is thus constrained.

(f) The firm may also achieve more effective cooperation as the result of more refined compensation schemes based on such cooperation. Better conflict resolution mechanisms including (limited) authority by fiat as well as mediation and arbitration are all preferable to contractual litigation.

(g) The firm can economize on bounded rationality and attenuate opportunism by minimizing the divergence of preferences of team members via selection, training, and socialization. Due sensitivity to the fact that this argument may also be used to rationalize the exclusion of marginal groups in society as well as to promote an excess of unwarranted indoctrination within an organization is noted.

(h) The firm may be the best solution for minimizing the inherent contractual trade-off between optimal investment (where small numbers may make short-term contracts problematic) and optimal sequential adaptation processes (where long-term contracting is problematic).

(i) The firm may minimize transaction costs (e.g., negotiation, sales, and distribution costs). The contractual problems in selling information may be particularly severe.

In sum, when a firm moves from vertical contracting to vertical financial ownership: (1) incentives change, (2) ownership changes, and (3) the ability to monitor and reward changes.

Limits of Vertical Financial Ownership. A host of potentially serious problems need to be considered before exercising the option of vertical financial ownership (Harrigan, 1984; Williamson, 1985):

(a) The vertical business creates increasingly serious complexities in management which weaken its efficiency. For example, manufacturing and marketing demand different managerial requirements resulting in a cost penalty for those who do not remain focused on their core competence in the value-chain. Also, the internal supplier may lack the experience and connections that non-integrated external suppliers have access to.

(b) Inflexibility of operations -- By putting more eggs into the same end-product basket, vertical financial ownership increases the firm's dependence on a particular segment of economic demand. This is especially critical when sunk cost investments increase exit barriers.

(c) Increased fixed (and sunk) overhead costs consume capital resources and reduce real options, a potential problem that can be particularly damaging to smaller firms.

(d) Bureaucratic inefficiencies and dulled incentives may result when there is a lack of competitive pressures on the costs of intermediate products resulting in undesirable slack in the system. Internal procurement decisions may become more prone to politicizing and logrolling. Inefficiencies may reduce the ability to respond to market, product, or technological changes, locking the firm into outdated capital or obsolete processes.

(e) There may be diminishing returns to management and a loss of control that becomes critical if an organization has an expansionary bias as a way to minimize internal conflict. Communication distortion (both deliberate and unintentional) may increase as firm size expands.

(f) Capacity imbalance and excess capacity may result in production cost disadvantages for the vertically integrated firm (due to contracting problems of achieving efficient scale).

(g) Psychological sunk costs as managers refuse to admit failure in certain segments of the value-chain may inhibit desired vertical de-integration.

At this point, it seems beyond dispute that vertical contracts and vertical financial ownership have both advantages and disadvantages for achieving vertical coordination. Section 4 suggests some criteria to consider in the choice of organizational form.

Section 4: **The Choice of Organizational Form**

Theoretical and empirical research suggests that there are several variables which should be considered in determining the choice of vertical contracting or vertical financial ownership. This section considers the following potentially critical variables: (1) frequency of transactions; (2) the number of potential trading partners; (3) use of firm-specific assets; (4) demand uncertainty; (5) uncertainty concerning the timing of the obsolescence of technologies; (6) technological interdependencies; (7) the difficulty of monitoring inputs; and (8) the difficulties of measuring output.

Frequency. Vertical financial ownership involves significant setup and maintenance costs. As transactions occur more frequently vertical financial ownership becomes more desirable since potential losses from not integrating outweigh the overhead costs of vertical financial ownership.

Number of potential trading partners. When there are many potential trading partners for buyers, there is a competitive environment which protects buyers since they have alternative sources if contractual difficulties occur. However, if there are only a small number of (potentially collusive) suppliers then vertical financial ownership may become necessary. The smaller number of growers per processor in the case of turkeys (Knoeber, 1989) may partially explain vertical financial ownership. Williamson (1985) also warns practitioners about the problem of "fundamental transformations". While initial contracting conditions suggest a large number of potential contracting partners, over time there may be "learning by doing" advantages that increase the efficiency of interaction with a small number of suppliers. Thus, switching costs for a buyer may become high and contractual frictions become more damaging.

Use of firm-specific assets. Williamson (1985) suggests that asset specificity is a major feature of the small-numbers problem which can lead to the vertical financial ownership choice. Specific assets may take the form of (a) human capital specificity; (b) site specificity; or (c) physical capital specificity. Frank and Henderson (1992) provide empirical support that asset specificity plays a role in vertical financial ownership patterns in the U.S. food industries.

(a) **Human capital specificity.** Anderson and Schmittlein (1984) found that human asset specificity (e.g., workers knowledge of firm-specific product features) led to significantly greater forward vertical integration in the electronic components industry. In fact, a review of the history of vertical integration in the United States reveals that forward integration out of manufacturing into distribution is much more common for durable products that require specialized knowledge of product attributes, in order effectively to sell and service an item, than it is for products which lack these features. Forward integration at the turn of the century by companies such as Singer Sewing Machine, National Cash Register, and McCormick Harvesters correspond with the human capital specificity argument (Chandler, 1977).

(b) **Site specificity.** The costs of transporting feed and mature broilers, along with the perishability (high storage costs) of live birds, have led growers and integrators (feed suppliers and processors) such as Perdue, and Tyson to locate near one another. Their broiler houses constructed by growers are relation-specific assets. Their value depends upon an ongoing supply relationship with the local feed mill and processor. Such an investment creates a bond to assure grower performance. More importantly, such investments induce self-selection by high-quality growers (much like an entry fee discussed earlier). Also, the feed mills and processing facilities provided by integrators are relation-specific assets because of their "site specificity" that protect a grower's investment from integrator opportunism (Knoeber, 1989). Tournaments of (at least 10) contract growers are used to compensate contract growers based on their relative performance in an environment of rapid technological change due to genetic innovation and medical advances. A tournament provides a way to adapt cheaply to changing productivity without renegotiating contracts. Tournaments difference out the effects of common shocks (e.g., bad weather) while maintaining incentives for effort. Why do broilers use tournaments while turkeys and eggs rely more on vertical financial ownership under similar conditions of uncertainty and site specificity? Knoeber (1989) suggests that the key idea for the success of tournaments is that there are a sufficient number of contestants. The number of producers per integrator is much higher for broilers than for turkeys or eggs. In contradiction to Stigler's life-cycle hypothesis (discussed in section 2 above), if site-specific supply is significant, vertical financial ownership will continue. Generic demand ("extent of the market") has little bearing in this case. Industry growth in demand may not eliminate small numbers if "learning by doing" (human capital specificity) economies are great.

(c) **Physical capital specificity**. In the automobile industry, for example, assemblers tend to own all the specialized tools and equipment employed by their suppliers in fabricating parts for an automobile company (Monteverde and Teece, 1982). Physical capital asset specificity is almost certainly extensive in the petroleum industry where major petroleum refiners are highly integrated, commanding extensive crude oil reserves, refining facilities, and pipelines (highly immobile assets!) through which crude oil and refined products are transported. High asset specificity makes opportunistic supplier decisions particularly risky for the buyer. Due to potential "hold-up" problems in vertical contracting, vertical financial ownership often obtains.

Demand uncertainty. The higher the demand uncertainty, the more incomplete a vertical contract is likely to be. Walker and Weber (1984, 1987) found in their studies on the make or buy decision for 60 relatively simple component parts associated with the initial assembly stage of an automobile manufacturer (where each component was evaluated by a procurement committee within the firm) that demand uncertainty was associated with vertical financial ownership in low competition vertical supply markets. Demand uncertainty was measured by (i) the extent to which significant fluctuations are expected in the daily or monthly volume requirement for the component and (ii) the extent to which volume estimates for the component are expected to be uncertain.

Uncertain timing of the obsolescence of technology. Low technological uncertainty based on a low uncertainty concerning the timing of the obsolescence of a particular technology leads to higher investments in firm-specific assets and hence higher vertical financial ownership. Walker and Weber (1984, 1987) measured this type of technological uncertainty by (i) The frequency of expected changes in specifications for the component and (ii) The probability of future technological improvements of the product. Consistent with this hypothesis high technological uncertainty with low specificity (high supplier competition) decreases the likelihood of vertical integration.

Technological interdependence and complexity. A coordinated change in a highly interdependent technological system requires recognition by those responsible for various parts of the system. Sometimes the market is slow to adapt quickly, as Stigler (1968) noted. Second, there are disclosure problems in market coordination for trading technological advances in knowledge. Information is particularly hard to sell because if the seller reveals the knowledge to the buyer, the buyer gets the knowledge for free. On the other hand, if the seller does not reveal information, the buyer may be reluctant to purchase. Third, contractual coordination may lead to a dissipation of benefits as knowledge diffuses rapidly to competitors. Fourth, organizing teams of workers to achieve complex, interdependent technological systems in a timely manner may be difficult in contracting relationships. Given these four problems, vertical financial ownership may be preferred. Ford and GM's in-house production of the technologically interdependent electrical system of their car is illustrative (Monteverde and Teece, 1982).

Difficulty of monitoring inputs. In some cases, observing input (effort) is a poor measure for making rewards. For example, Eisenhardt's (1985) study of retail salespeople in 54 stores found that service is a less programmable job because service is a highly abstract and variable commodity which is difficult to monitor. Coordination by fiat and monitoring of behavior (i.e., vertical financial ownership) decreases as more complex customer sales service is provided.

Difficulty of monitoring output. Two types of problems have been identified in the academic literature: (a) nonseparability problems and (b) quality measurement problems.

(a) **nonseparability problems.** Nonseparability problems are high when observing output is a poor measure for making rewards. Alchian and Demsetz (1972) provide the example of the difficulty of ascertaining individual productivity of two men loading items on a truck (team production) if only the output is observed. Also, team sales of electronic components result in a difficulty of measuring an individual salesperson's productivity. Anderson and Schmittlein (1984) found that this nonseparability problem increased forward vertical integration at a statistically significant level in the electronic components industry.

(b) **quality measurement problems.** While the quality of some goods can be easily determined upon inspection ("search goods"), the quality of other goods can only be determined by experiencing them. Barzel (1982) notes that the quality of an orange, for example, is determined in the eating (e.g., whether the orange is juicy) and is thus an "experience good". These "experience goods" may require a greater amount of control of inputs. At one time, you could go to the market to buy a fat pig and go home again jigga-de jig. However, suppose now hog farmers produce hogs with subtle and difficult to measure (leaner pork) quality variations determined by how the farmer fed the hog. The carcass performance has been transformed from a "search good" to an "experience good". Vertical financial ownership could allow the purchaser to control the farmer's behavior in order to more economically estimate carcass performance.

These critical variables, should be considered in combination for determining the choice of organizational form. For example, in the turkey industry there are: frequent transactions, a smaller number of growers per processor, high site specificity (as growers and processors are located near one another), demand uncertainty, technological interdependence between growers and processors for

achieving high quality products, and conditions where the monitoring of inputs are effective (high task programmability). Also, turkeys are an "experience good" where the processor must purchase the grower's product before the quality of the turkeys are fully established. Each of these dimensions suggest that vertical financial ownership would be a viable organizational form.

Section 5: Conclusions

Section 1 demonstrates that there are many possible objectives for vertical coordination. Section 2 describes a variety of vertical contracting mechanisms to achieve these various objectives. Section 3 considers the advantages and disadvantages of vertical financial ownership. Section 4 provides critical dimensions to consider in the choice of organizational form. The fundamental idea for the practitioner is that in changing market environments, successful decision makers are often involved in **a search for more efficient organizational forms (e.g., vertical contracts, franchising, equity joint ventures, vertical financial ownership).** This search process involves a comparative assessment of efficiencies among imperfect organizational forms. Differential efficiency of one existing organizational form relative to another can (for a time) be a source of competitive advantage.

This paper considers the choice of vertical contracting or vertical financial ownership[7]. Our third proposition summarizes the efficiency argument:

Proposition 3: Vertical financial ownership is more likely to be more efficient than vertical contracting under the following set of conditions:

(a) There is a high frequency of transactions.

(b) There are only a small number of potential trading partners.

(c) A high level of asset specificity (human, site, physical capital) locks trading partners into a small-numbers trading situation which may make contracting hazardous due to potential haggling costs and "hold-up" problems.

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[7] A more refined theory is still needed for determining when equity joint ventures and franchising arrangements are the more appropriate organizational form.

(d) Higher demand uncertainty makes contracting more difficult.

(e) Low uncertainty about the timing of the obsolescence of specific assets will allow greater investment in specific assets with greater vertical financial ownership.

(f) Higher interdependence and complexity of products to consumers often necessitate vertical financial ownership.

(g) Higher task programmability allows for effective monitoring of inputs and favors vertical financial ownership.

(h) High nonseparability problems necessitate that inputs be monitored in order to determine individual productivity. Thus, vertical financial ownership is favored.

(i) A higher degree of difficulty in ascertaining quality of product by inspection suggests that the monitoring of inputs is required. Once again, this favors vertical financial ownership.

References

Adelman, Morris A. (1972). The World Petroleum Market. Baltimore, MD: John Hopkins.

Akerlof, George A. (1970). The market for 'lemons': Quality uncertainty and the market mechanism. Quarterly Journal of Economics, 84: 488-500.

Alchian, Armen A. and Harold Demsetz (1972). Production, information costs, and economic organization. American Economic Review, 62: 777-795.

Allen, Douglas W. and Dean Lueck (1992). The 'back forty' on a handshake: Specific assets, reputation, and the structure of farmland contracts. Journal of Law, Economics, and Organization, 6: 366-376.

Anderson, Erin and David C. Schmittlein (1984). Integration of the sales force: An empirical examination. Rand Journal of Economics, 15: 385-395.

Armour, Henry Ogden and David J. Teece (1980). Vertical integration and technological innovation. Review of Economics and Statistics, 60: 470-474.

Arrow, Kenneth A. (1975). Vertical integration and communication. Bell Journal of Economics, 6: 173-183.

Babb, Emerson M. (1992). Management and financing of vertical coordination in agriculture: Discussion. American Journal of Agricultural Economics, 74 (5): 1238-1239.

Barry, Peter J., Steven T. Sonka and Kaouthar Lajili (1992). Vertical coordination, financial structure, and the changing theory of the firm. American Journal of Agricultural Economics, 74 (5): 1219-1225.

Barzel, Yoram (1982). Measurement costs and the organization of markets. Journal of Law and Economics, 25: 27-48.

Baumol, William J., John C. Panzar and Robert D. Willig (1982). Contestable Markets and the Theory of Industry Structure. New York: Harcourt Brace Jovanovich.

Blair, Roger D. and David L. Kaserman (1983). Law and Economics of Vertical Integration and Control. New York: Academic Press.

Bolch, Benjamin. W. and Damon, William W. (1978). The depletion allowance and vertical integration in the petroleum industry. Southern Economic Journal, 45: 241-249.

Carlton, Dennis W. (1979). Vertical integration in competitive markets under uncertainty. Journal of Industrial Economics, 27: 189-209.

Chandler, Alfred D. (1977). The Visible Hand: The Managerial Revolution in American Business. Cambridge, Mass.: Harvard University Press.

Coase, Ronald H. (1937). The nature of the firm. Economica, 4: 386-405.

Coase, Ronald H. (1988). The Firm, the Market and the Law. Chicago: University of Chicago Press.

Eisenhardt, Kathleen M. (1985). Control: Organizational and economic approaches. Management Science, 31: 134-149.

Featherstone, Allen M. and Bruce J. Sherrick (1992). Financing vertically coordinated agriculture firms. American Journal of Agricultural Economics, 74 (5): 1232-1237.

Frank, Stuart D., and Dennis R. Henderson (1992). Transaction costs as determinants of vertical coordination in the U.S. food industries. American Journal of Agricultural Economics, 74: 941-950.

Gallick, Edward G. (1984). Exclusive Dealing and Vertical Integration: The Efficiency of Contracts in the Tuna Industry. Washington, D.C.: Bureau of Economics Staff Report of the Federal Trade Commission.

Harrigan, Kathryn Rudie (1984). Formulating vertical integration strategies. Academy of Management Review, 9: 638-652.

Hobbs, Jill E., and William A. Kerr (1992). Costs of monitoring food safety and vertical coordination in Agribusiness: What can be learned from the British Food Safety Act 1990? Agribusiness, 8(6): 575-584.

Katz, Michael L. (1989). Vertical contractual relations. In R. Schmalensee and R. D. Willig (eds.), Handbook of Industrial Organization (pp. 655-721). Amsterdam: Elsevier Science Publishers.

Kilmer, Richard L. (1986). Vertical coordination in agricultural and food marketing: Integration. American Journal of Agricultural Economics, 68: 1155-1160.

King, Robert P. (1992). Management and financing of vertical coordination in agriculture: An overview. American Journal of Agricultural Economics, 74 (5): 1217-1218.

Klein, Benjamin A., Robert Crawford, and Armen A. Alchian (1978). Vertical integration, appropriable rents, and the competitive contracting process. Journal of Law and Economics, 21: 297-326.

Knoeber, Charles R. (1989). A real game of chicken: Contracts, tournaments, and the production of broilers. Journal of Law, Economics, and Organization, 5: 271-292.

Mahoney, Joseph T. (1992). The choice of organizational form: Vertical financial ownership versus other methods of vertical integration. Strategic Management Journal, 13: 559-584.

Marvel, Howard P. (1982). Exclusive dealing. Journal of Law and Economics, 25: 1-25.

Marvel, Howard P. and Stephen McCafferty (1986). Resale price maintenance and quality certification. Rand Journal of Economics, 15: 346-359.

Monteverde, K., and D. J. Teece (1982). Supplier switching costs and vertical integration in the automobile industry. Bell Journal of Economics, 13: 206-213.

Ornstein, S. I., and D. M. Hanssens (1987). Resale price maintenance: Output increasing or restricting? The case of distilled spirits in the United States. Journal of Industrial Economics, 36: 1-18.

Perry, Martin K. (1980). Forward integration by Alcoa: 1888-1930. Journal of Industrial Economics, 29: 37-53.

Phillips, Almarin and Joseph Mahoney (1985). Unreasonable rules and rules of reason: Economic aspects of vertical price-fixing. Antitrust Bulletin, 30: 99-115.

Porter, Michael E. (1980). Competitive Strategy. New York: Free Press.

Schrader, Lee F. (1986). Responses to forces shaping agricultural marketing: Contracting. American Journal of Agricultural Economics, 68: 1161-1166.

Sexton, Richard J. (1986). Cooperatives and the forces shaping agricultural marketing. American Journal of Agricultural Economics, 68: 1167-1172.

Shaffer, Greg (1991). Slotting allowances and resale price maintenance: A comparison of facilitating practices. Rand Journal of Economics, 22: 120-135.

Smith, Adam (1776). The Wealth of Nations. New York: Modern Library.

Sporleder, Thomas L. (1992). Managerial economics of vertically coordinated agricultural firms. American Journal of Agricultural Economics, 74: 1226-1231.

Stigler, George J. (1968). The Organization of Industry. Homewood, IL: Richard D. Irwin.

Streeter, Deborah H., Steven T. Sonka and Michael A. Hudson (1991). Information technology, coordination, and competitiveness in the food and agribusiness sector. American Journal of Agricultural Economics, 73: 1465-1471.

Telser, Lester G. (1960). Why should manufacturers want fair trade? Journal of Law and Economics, 3: 86-105.

Walker, Gordon, and David Weber (1984). A transaction cost approach to make-or-buy decisions. Administrative Science Quarterly, 29: 373-391.

Walker, Gordon, and David Weber (1987). Supplier competition, uncertainty and make or buy decisions. Academy of Management Journal, 30: 589-596.

Williamson, Oliver E. (1975). Markets and Hierarchies: Analysis and Antitrust Implications. New York: Free Press.

Williamson, Oliver E. (1985). The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting. New York: Free Press.

Willoughby, W. F. (1901). The integration of industry in the United States. Quarterly Journal of Economics, 16: 94-115.

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